

REMARKS

Claims 1-12, 16-24, and 26-32 are pending in the application, claims 13-15 and 25 being canceled and claims 31 and 32 being newly added herein. Claims 1, 16, 17, 27-29, and 31 are the only independent claims.

Specification

The disclosure is objected to because of the misspelling of the word “melanin” on page 23, line 22.

Applicant respectfully contravenes the Examiner’s objection to the disclosure. The word “eumelanin” refers to one type of melanin. Another type is pheomelanin. These two types of melanin are recited, for instance, on page 23, line 17, of the disclosure.

Claims Rejections - 35 U.S.C. § 112

Claim 3 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner specifically maintains that line 4 has an extra word making the meaning unclear.

In response to the rejection of claim 3 under 35 U.S.C. § 112, second paragraph, that claim has been amended to eliminate the extraneous word “is.”

Claims Rejections - 35 U.S.C. §§ 102 and 103

Claims 1, 7, 9-12, 17, 22, and 23 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,606,798 to Kelman.

Claims 2-6, 13-15, 18-21, and 24-26 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kelman in view of U.S. Patent No. 6,280,438 to Eckhouse et al.

Claims 16 and 27 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kelman in view of U.S. Patent Application Publication No. 2003/0167033 by Chen et al.

Allowable Claims The Examiner has allowed claim 29 and indicated that claims 28 and 30 would be allowable if rewritten in independent form to include all of the limitations of the base claim and any intervening claims.

Claim 28 Pursuant to this indication by the Examiner, claim 28 has been amended to incorporate the limitations of original claim 1. Claim 28, being rewritten in independent form to include all of the limitations of the base claim (original claim 1) and any intervening claims (none), is allowable over the prior art of record.

Claim 31 New claim 31 is a method claim with essential limitations parallel to corresponding limitations in allowed apparatus claim 29. Like claim 29, claim 31 distinguishes over the prior art. Nothing in the prior art teaches or suggests directing a first portion of electromagnetic radiation in a direction substantially parallel to a skin surface, to impinge on hair fibers protruding from the skin surface, and directing a second portion of electromagnetic radiation into the skin surface.

Claim 17 In response to the rejection of claim 17, that claim has been amended to incorporate the limitations of claim 25, which has been canceled. Applicant respectfully maintains that amended claim 17 distinguishes over the prior art and traverses the rejection of claim 25.

As set forth in amended claim 17 a hair treatment method comprises (a) generating electromagnetic radiation having a predetermined spectral composition and a predetermined intensity in a predetermined number of pulses each having a predetermined duration, the pulses having a predetermined total energy, and (b) directing the generated pulses from the generator

away from entering a skin surface and in a direction substantially parallel to the skin surface, to impinge on hair fibers protruding from the skin surface. The pulses have, at least in part, characteristic parameters including a spectral composition, intensity, and pulse duration effective to generate, in hair shafts protruding from the skin surface, heat energy transmissible along the hair shafts to weaken the same below the skin surface, to enable breaking of the hair shafts below the skin surface.

Kelman not only fails to disclose or suggest the method of amended claim 17 but also teaches away from the invention of this claim. Applicant's method entails the application of electromagnetic pulses such that the energy is absorbed and transmitted along the lengths of the hair shafts to enable breaking of the hair below the skin surface. In contrast, Kelman teaches the use of such radiation as to *vaporize* the hair at the skin surface. (col. 2, line 41). The applied energy is so high and so readily absorbable as to instantly sever the hair at the point of impingement. Applicant's invention as set forth in amended claim 17 contemplates a gradual absorption of the electromagnetic radiation so that heat is transmitted down the lengths of the hair fibers and into the skin.

Eckhouse et al. is directed to the use of electromagnetic energy to kill hair *follicles* for purposes of permanent hair removal. Pulsed electromagnetic radiation in its entirety is directed solely *into the skin* for absorption by the follicles. The Eckhouse patent does not teach or suggest targeting hair shafts, particularly hair fibers protruding above a skin surface.

Accordingly, one of ordinary skill in the art seeking to modify the method of Kelman would hardly consult Eckhouse for suggestions. Kelman is interested solely in protruding hair fibers and light energy that can sever hair fibers. Eckhouse is interested in follicle destruction and in light energy that is transmissible into the skin and absorbable by follicles. Eckhouse

wants permanent hair removal. Kelman wants to effectuate a temporary change in hair length by cutting protruding hair fibers at the skin line. There is accordingly no motivation provided by Kelman and Eckhouse to induce one of ordinary skill in the art to modify the methodology of Kelman to arrive at applicants' invention as set forth in claim 17.

Moreover, regardless of the characteristics of pulsed radiation that could be generated by the device of Eckhouse et al., one of ordinary skill in the art would be dissuaded from modifying Kelman's device to arrive at the method of applicant's amended claim 17 since Kelman teaches and requires *a quick cut* at the point of impingement only, *vaporizing* the hair at the point of impingement and leaving a portion of the hair in a detached unburnt condition and a further portion of the hair in an attached unburnt condition at the surface of the skin.

Claim 1 Applicant has amended claim 1 herein to incorporate the limitations of claim 13, which has been canceled together with claims 14 and 15 each of which contained subject matter included in claim 13. Applicant respectfully maintains that amended claim 1 distinguishes the invention over the prior art and particularly over the art relied on by the Examiner in rejecting the claims of the instant application. To the extent that the Examiner's rejection of claim 13 applies to amended claim 1, applicant respectfully traverses the rejection of claim 13.

As set forth in amended claim 1, a hair treatment device comprises a generator of electromagnetic radiation, optical guide componentry operatively connected to the generator so as to direct electromagnetic radiation from the generator away from entering a skin surface and in a direction substantially parallel to the skin surface, to impinge on hair fibers protruding from the skin surface, and a control unit operatively connected to the generator for inducing the generator to produce at least two bursts of electromagnetic radiation in combination. One of the

bursts has characteristic parameters including a spectral composition, intensity, and pulse duration effective to generate, in hair shafts protruding from the skin surface, heat energy transmissible along the hair shafts to weaken the same below the skin surface. Another of the bursts has characteristic parameters including a spectral composition, intensity, and pulse duration effective to sever the hair shafts above the skin surface.

The prior art relied on by the Examiner in rejecting claims 1 and 13, Kelman and Eckhouse, fails to disclose or suggest the device of applicant's amended claim 1.

Kelman is directed to a method of cutting hairs at the skin line. A laser beam is directed via mirrors to impinge on hairs at the skin surface. The laser beam has a wavelength which is strongly absorbed by hair, such as facial hair but which is not strongly absorbed by surrounding tissue, such as skin. The "operative wavelength of the laser source 14 enables hair to be vaporized and carbonized at the location of impingement of the laser beam 18 thereon, thus separating that portion of the hair still attached to the hair follicle from that extending outward from the impingement location, thereby producing a hair cutting effect." Kelman thus teaches a method wherein cutting is cleanly accomplished at the skin surface, by radiation that is strongly absorbed by hair so as to vaporize the hair and burn it only at the point of impingement of the laser beam. The laser beam is arranged to impinge on the hair and to cut the hair at a point of impingement only, leaving a portion of the hair in a detached unburnt condition and a further portion of the hair in an attached unburnt condition at the surface of the skin.

One of ordinary skill in the art following the teachings of Kelman would not provide a device for producing two or more bursts of electromagnetic radiation in combination where one of the bursts has characteristic parameters including a spectral composition, intensity, and pulse duration effective to generate, in hair shafts protruding from the skin surface, heat energy

transmissible along the hair shafts to weaken the same below the skin surface. This is contrary to the teachings of Kelman.

Moreover, there is nothing in the teachings of Eckhouse et al. to even suggest a device that produces two or more bursts of electromagnetic radiation *in combination* where one of the bursts has characteristic parameters including a spectral composition, intensity, and pulse duration effective to generate, in hair shafts protruding from the skin surface, heat energy transmissible along the hair shafts to weaken the same below the skin surface. (As to support in applicant's disclosure, see page 28, line 17, through page 29, line 2.)

Claim 27 Applicant has amended claim 27 to render it independent. Claim 27 incorporates all of the limitations of original claim 1 from which claim 27 directly depended. Applicant respectfully traverses the rejection of claim 27 under § 103(a).

As set forth in claim 27, a hair treatment method comprises (1) generating electromagnetic radiation having a predetermined spectral composition and a predetermined intensity in a predetermined number of pulses each having a predetermined duration, the pulses having a predetermined total energy, (2) directing the generated pulses from the generator away from entering a skin surface and in a direction substantially parallel to the skin surface, to impinge on hair fibers protruding from the skin surface, and (3) applying a dye to hair along the skin surface prior to the directing of the generated pulses.

Kelman, the principal reference relied on by the Examiner in rejecting claim 27, says nothing about a dye. Chen, the secondary reference relied on by the Examiner in rejecting claim 27, also says nothing about a dye. Instead, Chen is directed to photodynamic therapy wherein a photoreactive or photosensitizing agent is administered to tissues for purposes of diagnosing a condition of the tissues or therapeutically treating the tissues. The photosensitizing agent

selectively reacts with target cells, such as cancer cells. Where the object is detection, the photosensitizing agent or a chemically modified form thereof is exposed to radiation that induces fluorescence. Where the desired result is cell destruction, the photoreactive agent is induced to undergo a photochemical interaction with oxygen in the tissue under treatment that yields free radical species, such as singlet oxygen, causing local tissue lysing or destruction.

One of ordinary skill in the art would find no motivation in Chen or Kelman to use a photoreactive or photosensitizing agent according to the method of Chen in the hair treatment process of Kelman. The prior art of record provides no reason to subject hair, particularly protruding hair fibers or shafts, to photodynamic therapy. Hair is dead organic material. Hair does not contain any living cells and thus would not be suitable as a target of photodynamic therapy. In brief, the method of Chen is not applicable to protruding hair shafts or fibers and particularly not applicable to hair shafts or fibers which are being cut pursuant to the method of Kelman. The Examiner's citation of Chen is an impermissible application of hindsight. (The prior art has used photodynamic therapy to target *living hair follicles* in an attempt to permanently remove hair. But even this prior use would not suggest to one of ordinary skill in the art the application of a dye to protruding hair fibers for use in the method of Kelman.)

It is of further interest that in photodynamic therapy there is a significant delay between the administration of the photosensitizing agent, on the one hand, and the detection or lysing process, on the other hand. Such a delay would be undesirable in the hair cutting process of Kelman. With the application of a dye to protruding hair fibers, as conceived by applicant, no delay is necessary. Light may be applied immediately upon application of the dye.

Claim 16 For the same reasons, one of ordinary skill in the art would not provide a reservoir for a photoreactive or photosensitizing agent in the device disclosed by Kelman. The

prior art provides no reason to apply a photoreactive or photosensitizing agent to protruding hair shafts, which are already composed of dead cells. Accordingly, one of ordinary skill in the art following the teachings of Kelman and Chen would not provide a reservoir of dye and a dispenser in communication with the reservoir in a *hair shaft treatment device* comprising optical guide componentry operatively connected to a generator so as to direct electromagnetic radiation from the generator away from entering a skin surface and in a direction substantially parallel to the skin surface.

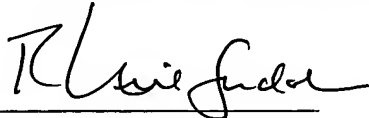
The claim amendments, if any, made herein are made without prejudice to applicants' right at this time to pursue additional subject matter in a separate continuation or divisional application at a later date.

Conclusion

For the foregoing reasons, independent claims 1, 16, 17, 27-29, and 31, as well as the claims dependent therefrom, are deemed to be in condition for allowance. An early Notice to that effect is earnestly solicited.

Should the Examiner believe that direct contact with applicant's attorney would advance the prosecution of this application, the Examiner is invited to telephone the undersigned at the number below.

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